

American Society for Testing Materials

BULLETIN

ISSUED  BI MONTHLY

The Society's Growth

AN ACTIVE ORGANIZATION attracts new members by the very force of its work and accomplishments. Conversely, increased membership should stimulate the organization's activities. The American Society for Testing Materials has always appreciated the value of a strong, healthy membership growth in supplying new workers in the Society, in extending the usefulness of A.S.T.M standards by their wider dissemination, and in providing added financial support.

Membership has shown a steady and healthy growth from the very beginning of the Society—due in large measure to the enthusiasm and interest of the members. To be maintained, the continued interest of the members is essential. Their support is enlisted in securing new members and continuing throughout the year the very satisfactory record of the two months just passed.

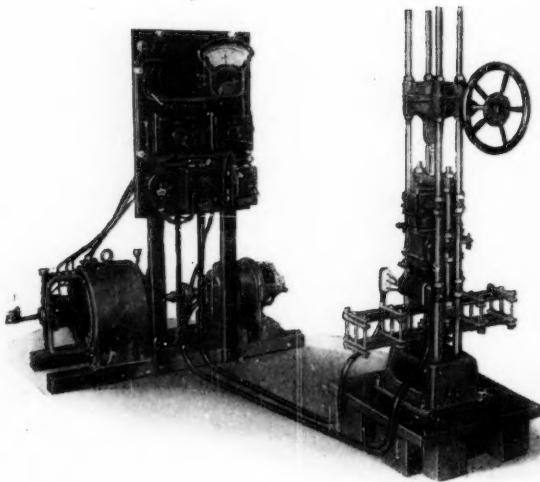
March, 1928



ENGINEERS' CLUB BUILDING
1315 SPRUCE ST., PHILADELPHIA

OLSEN

Testing and Balancing Machines

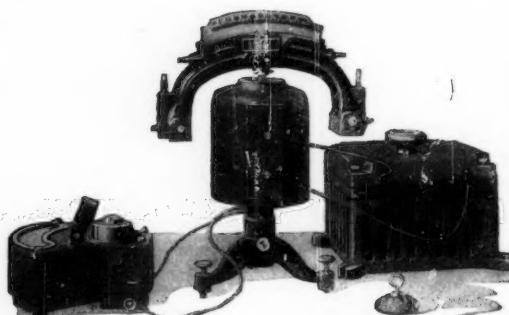


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High frequency of reversal of stress on the test specimen is obtained, thus reducing the time of testing as in older methods. This Haigh Alternating Stress Testing Machine has been selected by leaders in various industrial fields for determining the fatigue limit in materials.

**Your Material Testing Laboratory Should
be Equipped With This Machine**



HERBERT PENDULUM HARDNESS TESTER

This illustration shows the Herbert Pendulum Hardness Tester fitted with Furnace equipment for making hardness determinations under high temperature conditions. This is the only Hardness Tester that will show the working and cutting properties of your material besides indicating the equivalent of other Hardness Testers of to-day.

Information and data showing the wide range of application of the Herbert Pendulum Hardness Tester will be mailed upon request.

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American Society for Testing Materials



BULLETIN

ENGINEERS' CLUB BUILDING

1315 SPRUCE STREET

PHILADELPHIA, PENNA.

NUMBER 31

March 15, 1928

Program for Thirty-first Annual Meeting Progressing

Committee E-6 on Papers and Publications promises a very interesting program for the Thirty-first Annual Meeting of the Society, to be held at the Chalfonte-Haddon Hall, Atlantic City, N. J., June 25-29. Monday will be devoted to committee meetings and the first session of the annual meeting will be held in the morning or afternoon of Tuesday, June 26. The closing session will be held on Friday evening, June 29. In order to provide for the many items on the program several simultaneous sessions will be necessary. This plan of dividing the meetings has proved very successful at the meetings in recent years and provides more time for discussion of the individual items of the program. Adjoining rooms for holding these simultaneous sessions have been placed at our disposal in Haddon Hall. The Vernon Room will be used for all general sessions and when two rooms are needed, the Garden Room will be used. At one session, possibly a session devoted exclusively to it, will be given the Third Edgar Marburg Lecture. The Provisional Program for the meeting will be mailed to the members late in April with the next issue of the BULLETIN. All sessions will be on Daylight Saving Time.

Hotel Rates and Reservations

Chalfonte-Haddon Hall is operated exclusively on the American plan. Special rates have been made available to the members and their guests, which will prevail a few days before and after the meeting, as given on page 2. The rates vary according to the accommodations provided and according to the location of the rooms. Typical floor plans are reproduced to give the members an idea as to how the rooms have been classified.

Those members who wish to make reservations immediately may do so by addressing the hotel management. Some of the members may no doubt wish to defer making their reservations until the program of the meeting is distributed, at which time members will receive the usual blanks for making reservations. However, those members who plan to be in attendance at the meeting throughout are urged to make their reservations immediately since Atlantic City hotels may be filled to overflowing due to the fact that the meeting of the American Railway Association will overlap the early part of the A.S.T.M. meeting.

(Continued on page 2)

Who Benefits by Society Membership?

Members of the Society all appreciate the value of A.S.T.M. membership. It would be interesting, however, to know just what phase of the Society's work each member values the most. So many varied groups are represented in the membership, all having a common interest in the properties of materials, that each must see in the Society something different from the other. The scientist is interested primarily in extending the boundaries of knowledge of the properties of materials, and sees in the Society an opportunity for the exchange of ideas through fraternity with other scientists. The producer is interested in the better merchandising of his product, which can only be achieved through a better knowledge of the properties of the materials and the adoption of workable specifications. The designer must have the best information available in reference to the materials that he employs. The consumer is interested in the satisfactory performance of the materials he has specified and finds most useful those specifications that ensure satisfactory delivery of materials of specified requirements. The testing laboratory wishes to keep abreast of the latest developments in the testing of materials. The purchasing agent wishes to take advantage of any aids to the more economical purchase of suitable materials. The professional man values his membership because of the associations offered. Still others are content to receive the Society's publications as a compilation of data for use in reference.

Probably no one is a member of the Society for only a single one of the advantages offered, but for a number of them. But all of the Society's functions contribute to the general economy of present-day industry. Any strengthening of the Society's work will assist industry in that degree. Such strengthening can of course best be accomplished by bringing into the Society as members all those essentially interested in the properties of materials. Membership has shown a steady and healthy growth from the very beginning of the Society—due in large measure to the enthusiasm and interest of the members. To be maintained, the continued interest of the members is essential. Present industrial conditions in some sections of the country may not be satisfactory. But this should be no deterrent, but rather an incentive for seeing that the Society's work, always of a constructive nature, is pushed to the utmost.

Make use of the enclosed application blank. Others may always be had by addressing the Secretary-Treasurer.

Thirty-first Annual Meeting

(Continued from page 1)

The Chalfonte and Haddon Hall each has its own dining room service so that members who wish to take their meals together regularly should be sure to secure reservations in the same hotel. Members may at times and by arrangement in advance take their meals in either dining room but obviously this can be done only to a limited extent.

Reduced Railroad Rates

The passenger associations have again granted reduced railroad rates for the annual meeting at Atlantic City on the Identification Certificate Plan. Round trip tickets will be sold at one and one-half single fare to holders of Identification Certificates secured through the Society. Certificates will be mailed to all members about the end of May. Tickets will be validated by the railroad representative at the hotel but the holder must return by the same route used in going to the meeting. Further particulars will be announced in the next BULLETIN and in a Circular to Members issued late in May.

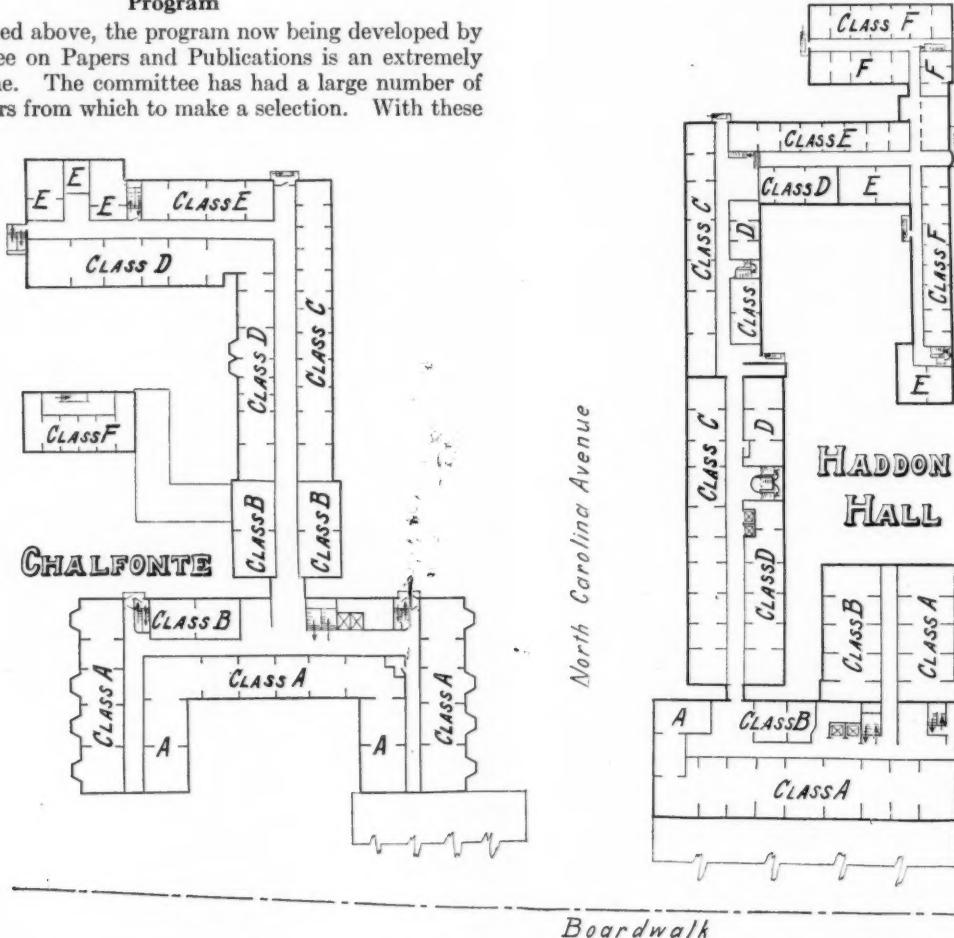
Program

As mentioned above, the program now being developed by the Committee on Papers and Publications is an extremely interesting one. The committee has had a large number of offers of papers from which to make a selection. With these

will be presented the many interesting reports of committees. Additional data will be presented on fatigue testing and on the properties of metals at high temperatures. There will be a discussion or symposium on the wear testing of metals and there will be a discussion on the properties of mineral aggregates.

Preprints of Reports and Papers

Preprints of reports and papers will be available and will be distributed in the same manner as in the past few years. Practically every item on the program for the 1927 annual meeting was preprinted and depending upon the receipt of material it is planned to duplicate this in connection with the items on the program for the 1928 annual meeting. The details of distribution are as follows: The Provisional Program mailed to each member in April will be accompanied by a return blank upon which members will be asked to indicate those reports and papers they wish to receive. Preprints will be distributed only to those members who request them. Members attending the annual meeting will receive a complete set of preprints.



The diagrams show 6 groups or classes of rooms, according to their relative desirability. The rates per day on the American Plan for these several classifications are as follows:

	CLASS A	CLASS B	CLASS C	CLASS D	CLASS E	CLASS F
Single Room with Bath.....	\$11.00*	\$11.00	\$10.00	\$10.00	\$ 9.00	\$ 9.00
Double Room with Bath.....	18.00	17.00	16.00	15.00	14.00	13.00
Single Room with Running Water.....			8.00	8.00	7.00	6.00
Double Room with Running Water.....			14.00	14.00	13.00	12.00

* Only ocean view as distinguished from ocean front rooms are available in Class A for single occupancy.

Dudley Medal to be Awarded

The papers presented at the 1927 annual meeting have been reviewed by a special committee appointed by the Executive Committee and the second award of the Charles B. Dudley Medal will be made at the meeting. The award is made to the author of a paper of outstanding merit constituting an original contribution on research in engineering materials. Further announcement concerning the medalist will be made in the next issue of the BULLETIN.

Marburg Lecture

The Edgar Marburg Lecture will again be a feature of the program and a special session will probably be devoted to it. The selection of a lecturer by the Lecture Committee will be announced in the next issue of the BULLETIN.

Entertainment

The entertainment features are in the hands of a special Entertainment Committee. No detailed announcement concerning the entertainment features can be made at this time but the members are assured that these will be amply provided for. Details concerning the annual golf and tennis tournaments will be announced to the members in due course. Other entertainment will be provided for the members and their guests who may not be interested in the tournaments. A registration fee of \$1.00 will be charged, which is intended to defray in part the entertainment and other expenses of the meeting.

Nominating Committee for Officers

The letter ballot on recommendations for appointments on the Nominating Committee for Officers was canvassed by a committee of tellers appointed by the President, consisting of Messrs. G. W. Fiss, Jr., and F. G. Tatnall. The report of the tellers to the Executive Committee showed that 624 legal ballots had been cast, of which one member received 41; one 33; one 29; one 24; two 22; one 14; one 12; one 11; three 10; three 8; five 7; three 6; five 5; and the remainder with 4 votes or less.

The Executive Committee accordingly made the following appointments on the Nominating Committee in conformity with the indications of this vote:

<i>Members</i>	<i>Alternates</i>
J. B. Young	J. A. Capp
T. G. Delbridge	Fred. Kenney
Warren Griffiss	I. T. Catharine
W. H. Bassett	N. L. Mochel
C. D. Hocker	H. H. Quimby
K. B. Cook	C. B. Finckel

<i>Ex-Officio</i>		
F. M. Farmer	W. H. Fulweiler	J. H. Gibboney

Acceptances of their appointments were received from all members and alternates with the exception of Messrs. J. B. Young, K. B. Cook and C. B. Finckel, who were obliged to decline because of engagements that conflicted with the date of the Nominating Committee meeting. Accordingly Mr. J. A. Capp served in place of Mr. Young; and Mr. P. J. Freeman was appointed in place of Mr. Cook.

The Nominating Committee met at Society headquarters on March 9 and made nominations for President, one Vice-President and four Members of Executive Committee to succeed those whose terms of office expire at the coming annual meeting. In accordance with the provisions of the By-laws the nominations will be announced to the members in the next BULLETIN.

New International Association for Testing Materials

In the BULLETIN for November, 1927, there was reported the action taken by the official delegates to the International Congress for Testing Materials held at Amsterdam in September that led to the decision to organize "The New International Association for the Testing of Materials" with the following objects:

"To secure international cooperation, exchange of views, experience and knowledge in regard to all matters connected with the Testing of Materials. The principal means of securing this result is to be the holding of periodical International Congresses at intervals of not less than three or more than five years, so far as circumstances permit. The New Association shall, however, be free to adopt other additional methods of securing and maintaining international contact as circumstances may suggest. Questions of standardization of materials are to be regarded as being outside the scope of the Association."

A constitution of the New Association was adopted by the delegates to the Congress and has been referred to their respective national organizations for ratification. This constitution, which was published in full in the November BULLETIN, has now been approved by the Executive Committee of the Society; the objects for which the New Association has been formed have been endorsed, and the Executive Committee recommends that members of the Society interested in the accomplishment of these objects shall formally apply for membership in the New International Association.

In all countries such as ours where there is a national association for testing materials, membership is open to all individuals, companies and corporations who are members of their national association. The membership subscription for individuals is one dollar (American); for companies and corporations, not less than two dollars.

In order to be of service to prospective American members, and particularly to simplify the financial transactions involved, the Executive Committee has authorized the Secretary-Treasurer to solicit applications for membership and to receive subscriptions, such applications and subscriptions to be forwarded periodically to the Secretary of the International Association. Members who desire to become affiliated with the New International Association are therefore requested to advise the Secretary-Treasurer of their intention, using for that purpose the card that accompanies this BULLETIN. Such members will then receive a form supplied by the International Association upon which their formal application for membership may be made and with which their annual subscription may be forwarded.

There are a number of matters relating to American membership in the International Association concerning which we are at present corresponding with the secretary of the Association, of which announcement will be made later.

Cooperation with American Leather Chemists

Upon the recommendation of Committee D-2 on Petroleum Products and Lubricants there has been formed a joint committee of the Society and the American Leather Chemists Association for the purpose of studying the cold test for fatty oils, especially neats foot oil. The applicability of the present Method of Test for Cloud and Pour Points of Petroleum Products to fatty oils is to be studied. The Society's representatives in this cooperative work are the members of Subcommittee XVI on Cloud and Pour Test, of Committee D-2, under the chairmanship of Mr. R. R. Matthews of the Roxana Petroleum Corporation, St. Louis, Mo.

AMERICAN SOCIETY FOR TESTING MATERIALS

BULLETIN

Issued Bi-Monthly

Engineers' Club Building, 1315 Spruce St., Philadelphia, Pa.

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Number 31

March 15, 1928

The Annual "Shower" of Papers

IN an article on this page President Moore has referred to the "annual manuscript shower." He might this year truthfully have said a "deluge." Never before, in the memory of the proverbial oldest living inhabitant, has the Papers Committee received such a deluge of papers of obvious value and upon subjects that are extremely pertinent for discussion at a meeting of the Society. At the time of its meeting on February 27 there were 56 offers of papers, of which approximately a fourth had been solicited by the committee. Based on information advanced by the authors these 56 papers would occupy not less than 850 printed pages; but not even with the increased appropriation by the Executive Committee for 1928 Proceedings of \$2000 over last year is it possible to publish more than 600 to 650 pages of technical papers this year, for allowance must be made for discussions, and we do not yet know how voluminous will be the reports of our committees.

Probably no one will envy the Papers Committee in its task of bringing this volume of material within the required limits. The committee has accepted 47 of the 56 offers, the acceptances of the papers themselves being contingent upon examination of the manuscripts, and has fixed space limitations that will keep the total within about 600 pages. This leaves some slight room for such expansion as may be found necessary in developing a well-rounded program.

This is an extremely healthy condition and is indicative of the magnitude of research in the materials field. Incidentally, the required condensation of papers is not seriously detrimental to their value, for it puts authors upon their mettle to present facts, discussions and conclusions in the most concise form possible, which in turn is a benefit to the member who wants to read all papers of interest to him.

There remains now only the work of editing about 1300 pages of technical papers and reports! However, the staff is ready.

Thoughts on the Oral Presentation of Papers

A Timely Suggestion by the President of the Society

The spring of the year is a time sacred to many duties and achievements, among them the presentation of A.S.T.M. papers for the June meeting. After the exhortations of the Secretary and the Committee on Papers and Publications have had their due effect in the annual manuscript shower, the authors of papers, especially the younger authors, are urged not to relax their efforts entirely but to give some thought to the oral presentation of the test results and theoretical discussions they have carefully written.

It would be going altogether too far to say that a good presentation may make mediocre material worth while, but it is certainly true that an ineffective presentation may seriously diminish the value of good material. One effect of a good presentation of worth-while material is to give the listeners the impulse to read, or to re-read, the printed paper, to cause them to speak of it to their friends, and to help the work to receive the attention it deserves, but which it otherwise may not receive.

In general, the oral presentation of a paper requires a different treatment from the written presentation. The writer would urge the authors, especially the younger ones, to prepare in addition to their written papers, careful notes, or, better still, completely written papers for oral presentation designed to emphasize and elaborate the chief points and to omit, in so far as it is possible, matter of secondary importance. It may seem rather absurd to some to urge a "rehearsal" of a technical paper, yet the reading aloud of the material prepared for oral presentation, either to an empty room or to a long-suffering wife or chum, helps wonderfully in showing up weak points that should be eliminated and strong points that should be emphasized.

Such a rehearsal also enables the speaker to make a fairly accurate estimate of the time necessary for presentation, and to avoid the shutting-off of a strong conclusion by the red light or the chairman's gavel. The writer has been a reasonably attentive member of many audiences, and he has yet to find one which is not rather kindly disposed to a speaker who errs on the side of brevity. Moreover, it is here asserted, positively and dogmatically, that no audience is pleased or greatly benefited by a speaker who reads to the desk rather than to the audience, or who cannot be heard clearly and without strained attention.



President.

Society Appointments

Announcement is made of the following appointments:

E. A. Snyder, Vacuum Oil Co., New York City, and Vice-President G. W. Thompson, Chief Chemist, National Lead Co., Brooklyn, N. Y., as the Society's representatives on the U. S. National Committee of the International Electro-technical Commission.

Dean Harvey, Materials Engineer, Material and Process Engineering Department, Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa., and L. J. Trostel, Chief Chemist, General Refractories Co. Laboratories, Baltimore, Md., as the Society's representatives on the Joint Committee on Foundry Refractories, functioning under the general sponsorship of the American Foundrymen's Association.

Many Thirty-Dollar Company Memberships Acquired

The response of the companies, firms, corporations, industrial associations and commercial testing laboratories, whose dues in the Society were by amendment of the By-laws last year increased from \$15 to \$30, has fully justified the confidence of the Executive Committee that the industries as represented through company membership would give the requested added support to Society work in view of its increasing value from both the industrial and technical viewpoints. It will be recalled that the increase was put on a purely voluntary basis by permitting companies that did not wish to maintain a company membership to continue their affiliation with the Society by transferring their membership to an individual at dues of \$15.

An analysis as of March 1 has shown that of the 1565 company members on October 27, 1927, when formal notice of the change in By-laws to become effective January 1, 1928, was sent to them, 809 have retained their membership with increased dues, 351 have transferred to individual membership and 110 have resigned, leaving about 300 still to be heard from. It is believed that a considerable proportion of the latter will retain company membership.

Offsetting losses due to resignations there have been eleven transfers of individuals to company members. Also invitations to acquire company membership have been extended to approximately 625 companies that have been affiliated with our activities through personal membership of one or more of their employees. In such cases the usual entrance fee for new members of \$10 will be waived, and it is expected that a number of the more active companies in this category will acquire company membership under this plan.

Twenty-seven new company memberships have been acquired since the first of the year, bringing the total of such memberships on March 1 to 836, out of a total Society membership of 4215.

Special Committee to Study Use of Specifications in Market Quotations

As an outcome of a recommendation made by Committee B-2 on Non-Ferrous Metals and Alloys, referred to in the November, 1927, BULLETIN, the Executive Committee has authorized the appointment of a special committee of the Society "to study and promote the use of specifications covering copper alloys (in ingot form) as the basis of price quotations in the technical and trade journals." It is believed that the usefulness of A.S.T.M. specifications in all fields would be enhanced if they were more generally made the basis of market quotations and purchases. At the same time it is felt that efforts in this direction should for the present be confined to copper alloys in ingot form, where there apparently is particular need for greater definiteness in price quotations, and that it be extended into other fields only after some experience has been gained in this method of promoting the use of A.S.T.M. specifications.

Past-President Guilliam H. Clamer has accepted an invitation to become chairman of the proposed committee, which will consist of five producers of copper alloys, five consumers, and five representatives of technical and trade journals. Considerable interest has been shown by representatives of all three groups in the possibilities of this work and it is planned if possible to organize the committee before the next annual meeting of the Society.

Student Membership in the Society

Beginning with this year, the plans for Student Membership in the Society made possible by recent amendment of the By-laws were brought directly to the attention of over thirty members of the Society serving on the faculties of leading universities and technical schools of the country. Most of these men have responded enthusiastically to our request that they advise technical students of the junior and higher classes of the activities of the Society and of the advantages to the student interested in the study of materials, of affiliation with our work. Copies of a special booklet prepared to set forth these advantages in an interesting way are being distributed to students as occasion affords, and the faculty members are being asked to endorse applications for membership that are brought to them by students.

The Executive Committee has made a liberal arrangement for student members by which for the very nominal dues of \$3 (with no entrance fee) they will receive the Book of Standards, the Year Book, BULLETIN and preprints of reports and papers. It is appreciated that under this plan the student member is carried at a loss financially. It is felt, however, that this is greatly offset by the educational features of the plan, in that it will strengthen materially the work of the Society in the future if the coming engineers know of the A.S.T.M. and its activities so that later in life they will be prepared to make use of and support its work. It is hoped, of course, that upon graduation the student members will retain their affiliation with the Society and it is felt to be an advantage of inestimable value to have this younger generation of technologists growing up within the Society and becoming active in its affairs.

Although only two months have elapsed since this work was begun there are now 114 student members. A classification of membership by technical schools appears on page 10.

The Secretary-Treasurer will be glad to send further information about student membership to any member upon request. He would be particularly interested in hearing from those members who are on faculties of technical schools.

The Budget for 1928

The Society's activities for the year have been based upon a budget that anticipates total receipts of \$121,650, of which \$83,500 are estimated from dues and entrance fees, \$28,900 from sales of publications and \$9,250 from a number of miscellaneous items, including advertising in the BULLETIN and interest on deposits and investments.

The preparation of the Budget for this year presented an interesting problem in view of the uncertainties in connection with the increase of dues of company members. The budget has been based on the expectation of having at least 950 company members by the close of the year and a net growth in membership at least equal to that of last year.

It has been estimated that the *net* income this year from increased dues of company members will be approximately \$12,000. Of this sum \$2000 has been added to the sums normally available for Proceedings and Book of Standards; about \$3000 has been applied to salaries of a technical assistant and additional clerical assistance; and \$5,000 has been assigned to a reserve fund which is to be set up only if the income from current dues permits, which now seems probable. This reserve will be applied if necessary to publication expenses, but is designed more particularly as a contingent fund against possible expense in connection with rental of headquarters at the expiration of our present lease.

Use of A. S. T. M. Standards in Building Codes

In line with our policy of informing the members of important ways in which A.S.T.M. Standards are put to use, we are giving below a statement prepared by Mr. R. P. Miller, a consulting engineer of New York City, covering the use of standards in building codes. Mr. Miller has long been associated with building code work and is a member of the Building Code Committee of the Department of Commerce:

In recent years, there has been a marked increase in the use of the A.S.T.M. standard specifications of materials in the formulation of new or revised building codes. As long as there was a limited number of products that entered into building construction, the insertion of a short specification for each of the different materials did not involve much space in such a code. However, as the variety of materials increased, the inclusion of specific statements as to the quality tended to enlarge greatly the statutory provisions.

The propriety of reference in statutes to certain specifications prepared by unofficial bodies, has at times been questioned though the matter has apparently never been put to an actual test in the courts. One of the difficulties in making reference to the specification prepared by a national body, such as the American Society for Testing Materials, is that at the time the statute is enacted the particular specification in vogue at that moment would be the only one that could be recognized. It could not legally be provided that future changes in a specification over which the legislative body or its administrative representatives have no control, should be effective. In some cases, an attempt has been made to make changes in such specifications effective by referring them to "current" specifications. The difficulty is not solved by this, as the question immediately arises whether the "current" applied to the specifications in force at the time the statute was enacted or was intended to refer to the specifications at the time they were actually to be applied.

When the present New York City code was adopted in 1915, the situation was met on the advice of the corporation counsel, by authorizing the promulgation by the administrative official of specifications and adding that "in the absence of such specifications" the material in question shall conform "with the standard specifications of the American Society for Testing Materials." A reference of this kind to the A.S.T.M. specifications is found in Section 25 on Lime, Section 26 on Cement and Section 30 on Iron and Steel. But in New York City, the right of the superintendent of buildings (now transferred to the Board of Standards and Appeals) to promulgate specifications has been provided for by statute. In other cases, that right might possibly not exist.

Among the leading cases in which use has recently been made of the standard A.S.T.M. specifications, is the Uniform Building Code prepared by the Pacific Coast Building Officials' Conference, a statute that is being adopted quite generally by municipalities west of the Rocky Mountains. In section 2601 of that code, it is provided that the methods used for testing materials shall follow those recommended by the American Society for Testing Materials. In following sections, the quality of brick, cement, gypsum and other materials, is required to meet the appropriate A.S.T.M. specifications. In dealing with fireproof construction, the standard test specifications of the A.S.T.M. are also used.

Similarly, the building code recommended by the National Board of Fire Underwriters, refers to the A.S.T.M. specifications as the standards of quality for lime, cement, steel and iron, and in connection with timber, directs attention in a note to the "Standard Classification of Timber Defects" and the "Standard Specifications for Yellow Pine Bridge and Trestle Timbers of the American Society for Testing Materials." When dealing with fire tests of construction, this recommended code prescribes the methods of the standard A.S.T.M. tests for floors and partitions as those to be followed.

As already indicated, the verbatim inclusion of quality specifications for different materials in building codes is objectionable from the standpoint of making the statute too bulky as well as carrying the disadvantage of not having the specifications up to date. It seems that the situation has been fairly well met without the necessity of mentioning any definite specification by a provision in the recent Niagara Falls Building Code, prescribing that "for carrying into effect its provisions, the building commissioner shall adopt rules as prescribed in this ordinance and con-

sistent therewith, it being the intent of this requirement that the standards of the various national technical organizations, as the same may be amended from time to time, shall become the rules of practice under this ordinance."

An examination recently made by the office staff reveals a large number of A.S.T.M. Standards referred to in the various building codes of the country. These references are either direct, citing the specifications by serial designation or the requirements appearing in the code are in conformity with A.S.T.M. Standards. The following standards are of interest in connection with this building code work and are those to which most frequent reference is made:

- For Structural Steel for Buildings (A 9 - 24).
- For Steel Castings (A 27 - 24).
- For Gray-Iron Castings (A 48 - 18).
- For Refined Wrought-Iron Bars (A 41 - 18).
- For Billet-Steel Concrete Reinforcement Bars (A 15 - 14).
- For Rail-Steel Concrete Reinforcement Bars (A 16 - 14).
- For Cold-Drawn Steel Wire for Concrete Reinforcement (A 82 - 27).
- Specifications and Tests for Portland Cement (C 9 - 26).
- For Quicklime for Structural Purposes (C 5 - 26).
- For Hydrated Lime for Structural Purposes (C 6 - 24).
- For Gypsum (C 22 - 25).
- For Calcined Gypsum (C 23 - 22).
- For Gypsum Plasters (C 2S - 27).
- For Gypsum Wall Board (C 36 - 25).
- For Gypsum Partition Tile or Block (C 52 - 27).
- Methods of Testing Gypsum and Gypsum Products (C 26 - 27).
- For Concrete Building Brick (C 55 - 24 T).
- For Building Brick (Made from Clay or Shale) (C 62 - 27 T).
- Methods of Testing Brick (C 67 - 27 T).
- For Hollow Burned-Clay Load-Bearing Wall Tile (C 34 - 27).
- For Hollow Burned-Clay Floor Tile (C 57 - 27).
- For Hollow Burned-Clay Fireproofing, Partition and Furring Tile (C 56 - 27 T).
- Method of Test for Unit Weight of Aggregate for Concrete (C 29 - 27).
- Method of Test for Voids in Fine Aggregate for Concrete (C 30 - 22).
- Methods of Making Specimens of Concrete in the Field (C 31 - 27).
- Methods of Making Compression Tests of Concrete (C 39 - 27).
- Method of Test for Organic Impurities in Sands (C 40 - 27).
- For Concrete Aggregates (C 33 - 26 T).
- Rules for Inspection of Concrete and Reinforced Concrete Work (C 44 - 22 T).
- For Fire Tests of Building Construction and Materials (C 19 - 26 T).
- For Structural Wood Joist, Planks, Beams, Stringers and Posts (D 245 - 27).
- Definitions of Terms Relating to Structural Timber (D 9 - 15).

An effort is being made to keep administrators of building codes advised concerning the latest A.S.T.M. Standards in effect, so that the codes may be kept up to date and the use of A.S.T.M. Standards facilitated in this way.

A.S.T.M. Research Fund

There was added last year to the A.S.T.M. Research Fund the sum of \$2000, pursuant to the policy of adding to this Fund annually not less than one-half of the entrance fees received during the year. The Fund now totals \$3000, which is invested in long-term bonds. The income for this year has been set aside by the Executive Committee for such use as the Committee on Correlation of Research may recommend. Although small at present the Fund will grow steadily and we are confident that additions will be made from time to time by those who see the wisdom of enabling the Society to initiate and support studies of the properties of engineering materials, upon which the better utilization of materials, and indeed our very work of standardization, are dependent.

COMMITTEE ACTIVITIES

Space in the BULLETIN is reserved for items of interest about committee activities. Officers of committees are invited to prepare information of suitable character for publication.

Schedule of Committee Meetings

DATE	COMMITTEE	PLACE
March 15-16	D-11 on Rubber Products	Akron, O.
March 21	B-2 on Non-Ferrous Metals and Alloys	New York City
March 21-23	GROUP COMMITTEE MEETING (31 Committees)	Washington, D. C.
March 26-27	D-2 on Petroleum Products and Lubricants	Cleveland, O.
March 28	Sectional Committee on Classification of Coal	New York City
March	C-6 on Drain Tile	Chicago, Ill.
April 10	Executive Committee	Philadelphia
April 19-20	D-9 on Electrical Insulating Materials	Baltimore, Md.
April 24	C-9 on Concrete and Concrete Aggregates	Washington, D. C.
April 25-27	D-16 on Slate	Easton, Pa.

Group Committee Meeting in Washington

The group committee meeting, announced in earlier issues of the BULLETIN as being held in Washington over the dates March 21 to 23, promises to be one of the largest, if not the largest, group meeting yet held, with the following 31 committees participating:

A-1 on Steel	Sub-Committee IV, D-14, on Testing of Wire Screen Cloth
A-2 on Wrought Iron	D-15 on Thermometers
A-3 on Cast Iron	D-17 on Naval Stores
A-5 on Corrosion of Iron and Steel	Editorial Committee of E-1
A-6 on Magnetic Properties	Tech. Comm., E-1, on Chemical Composition
A-8 on Magnetic Analysis	Tech. Comm., E-1, on Methods for Density
B-1 on Copper Wire	Tech. Comm., E-1, on Plasticity, Consistency, Etc.
B-3 on Corrosion of Non-Ferrous Metals and Alloys	Sec., E-1, on Coarse Screens
C-1 on Cement	E-5 on Standing Committees
C-3 on Brick	Sec. Comm. on Cast-Iron Pipe
C-7 on Lime	Sec. Committee on Copper Wire
C-10 on Hollow Masonry Building Units	Sec. Comm. on Zinc Coating of Iron and Steel
C-11 on Gypsum	Joint Comm. on Phosphorus and Sulfur in Steel
D-1 on Preservative Coatings for Structural Materials	Joint Research Comm. on Effect of Temperature on the Properties of Metals
D-4 on Road and Paving Materials	
D-5 on Coal and Coke	
D-8 on Bituminous Waterproofing and Roofing Materials	

All meetings will be held at The Mayflower, where arrangements have been made for establishing our headquarters and where meeting room facilities have been placed at our disposal. A local Committee on Arrangements has been organized consisting of the following:

Jerome Strauss, Chairman
A. T. Goldbeck
E. F. Kelley
J. W. McBurney

This committee is arranging for a buffet luncheon on each of the three days of the meeting and for an informal dinner on Thursday evening. One or two prominent Government officials will speak at the dinner. There are many places of interest in the Washington district and the committee will make arrangements for groups to visit any places in which they may be interested.

Petroleum Test Methods Submitted to A.E.S.C.

Upon the recommendation of Committee D-2 on Petroleum Products and Lubricants, functioning under A.E.S.C. procedure as the Sectional Committee on Tests of Petroleum Products, the Society as sponsor has submitted the following 16 A.S.T.M. standard methods for testing petroleum products for approval as American Standard and 3 tentative methods for approval as Tentative American Standard:

Abridged Volume Correction Table for Petroleum Oils (D 206 - 25).
Analysis of Grease (D 128 - 27).
Burning Quality of Kerosine Oil (D 187 - 27).
Burning Quality of Long Time Burning Oil for Railways (D 219 - 27).
Burning Quality of Mineral Seal Oil (D 239 - 27).
Distillation of Gasoline, Naphtha, Kerosine and Similar Petroleum Products (D 86 - 27).
Distillation of Natural Gas Gasoline (D 216 - 27).
Flash Point by Means of Pensky-Martens Closed Tester (D 93 - 22).
Flash and Fire Points by Means of Open Cup (D 92 - 24).
Melting Point of Paraffin Wax (D 87 - 22).
Steam Emulsion of Lubricating Oils (D 157 - 27).
Sulfur in Petroleum Oils Heavier than Illuminating Oils (D 129 - 27).
Thermal Value of Fuel Oil (D 240 - 27).
Viscosity of Petroleum Products and Lubricants (D 88 - 26).
Water in Petroleum Products and Other Bituminous Materials (D 95 - 27).
Water and Sediment in Petroleum Products by Means of Centrifuge (D 96 - 24).
Cloud and Pour Points of Petroleum Products (D 97 - 27 T).
Neutralization Number of Petroleum Products (D 188 - 27 T).
Penetration of Grease and Petrolatum (D 217 - 27 T).

Action by the A.E.S.C. on D 157, D 95 and D 96 has been temporarily deferred pending the possibility of slight revisions in these methods to be considered at the March meeting of Committee D-2. The remaining methods have been referred to ballot of the A.E.S.C. for approval.

Sectional Committee on Tests of Road Materials Organized

The Society is sponsor, under A.E.S.C. procedure, for the development of standard methods of test for road and paving materials. It has formed a sectional committee on this subject by adding to the personnel of Committee D-4 on Road and Paving Materials officially appointed representatives of a number of organizations, most of which have been informally represented on the committee heretofore. The following associations are now formally represented on the committee: American Association of State Highway Officials, American Concrete Institute, American Electric Railway Association, American Petroleum Institute, American Road Builders Association, American Society of Civil Engineers, American Society for Municipal Improvements, American Society for Testing Materials, Asphalt Association, Associated General Contractors of America, Eastern Stone Association, Granite Paving Block Mfrs. Association, National Association of Sand and Gravel Producers, National Crushed Stone Association, National Paving Brick Mfrs. Association, National Slag Association, Portland Cement Association, U. S. Bureau of Public Roads, U. S. Bureau of Standards.

The committee consists of 81 members classified into 39 producers, 27 consumers and 15 general interests.

The personnel has been approved by the A.E.S.C. and a number of the A.S.T.M. methods will now be reviewed for approval as American Standard.

Rubber Testing

Several years ago, Committee D-11 on Rubber Products recognized the necessity for developing performance tests for rubber products. The committee realized that the general specifications and tests for rubber products were in need of revision due to their inability to predict whether rubber products would render the highest class of service. A sub-committee was organized for the purpose of developing performance tests designed to show the proper type of material for the service required.

Life Test:

One of the performance tests required the development of a method to determine the life of rubber belting in service. Rubber belts fail, sooner or later, in nearly all cases from ply separation or bootlegging. Friction tests for determining the quality of the rubber bond between the plies of fabric, tensile strength, elongation under various loads and at rupture, and certain flexibility tests are all in general use, but they do not predict the life of a belt under actual service conditions; also, these tests are chiefly applicable to development work and factory control.

For a quick service test that can be made at any place with minimum equipment, there remains the friction pull, which is in greater use than any other test. It causes ply separation in a very short time or, as has been expressed, in one cycle. Under correct service conditions, a belt will flex several million cycles before it fails from ply separation or bootlegging. It is thus seen that the friction pull is far too highly an accelerated test to yield results that will indicate the life of a belt under service conditions.

A few producers of high-grade belting have dynamometer installations where belting may be tested under service conditions. However, this test has several disadvantages: Several hundred hours are required before a high-grade belt will fail; about 13 ft. of belting is required for each test sample, if two are tested at the same time, which adds materially to the cost of the test and is a burden on the purchaser; and the equipment is expensive and constant attention is necessary throughout the test, making the labor cost of the test high.

A test has been developed by the sub-committee, after considerable experimental work, which appears to be satisfactory. The apparatus used is known as a flexing machine, which machine will test five samples of belting, 1 by $8\frac{1}{2}$ in., at one time. Four or five-ply samples are bent around $1\frac{1}{4}$ -in. mandrels and are gripped by clamps, the samples oscillating back and forth over the mandrels by the use of a motor driven mechanism. The speed is 170 strokes per minute, and each head is equipped with a counting device. Failure of the samples is determined by breaking down of the rubber bond between the plies. From the results obtained, it is evident that the test is a more satisfactory method for estimating the life of rubber belting than that of the friction test now used.

So far, the work of the sub-committee indicates that the flexing machine is a valuable piece of apparatus for laboratory and development work and factory control on rubber belting, as it gives a series of tests that quickly indicate the quality of the belt, and by means of these tests, coupled with life tests on the belting dynamometers, the quality of rubber belting has been greatly improved.

Until the collection of data which will give an accurate comparison between flexings, dynamometer, and actual life tests in service is completed, the committee feels that not enough data is at hand to justify specifying flexing tests in even tentative specifications.

Abrasion Test:

Another of the performance tests is the abrasion test. The work of developing such a test was entered into with the

thought of not only developing a test that would be suitable for specifications but if this took too long, to develop an abrasion test that in the meantime would be helpful in research work in studying materials.

As a first objective the committee decided to determine the status of abrasion testing, compared with other forms of testing, and found that the variation in results of different laboratories in abrasion testing was no greater than that in tension testing. The second objective of the committee consisted in studying the degree of correlation between machine tests and service tests.

The first step consisted in the choice of compounds to be investigated and the choice of service conditions under which the tires were to be tested. The compounds chosen were as follows: Low abrasion standard, high abrasion standard, second grade tread, third grade tread and under-cured tread.

The second step consisted in testing slabs on abrasion machines taken from the same stock that was used in making the tires for the service tests.

The preferred service conditions determined upon were hilly concrete roads. Where this condition could not be realized, as in England, the tests were to be made on macadam roads with a notation covering the service conditions.

In order to obtain more complete data on the five compounds, three rubber laboratories prepared sets of slabs, which were submitted to a score of laboratories for abrasion test, both as received and after standing for ten days in a desiccator.

Only the Goodyear and Miller Laboratories have reported service tests to date but promises have been received that tires would be tested from the following committee members: The Ajax Rubber Co., Binney & Smith, Fisk Rubber Co., The New Jersey Zinc Co., and The Dunlap Rubber Co. of England.

From the results of the service tests submitted by the laboratories it was found that the superior wearing quality expected of the high abrasion standard and the poorer wearing quality expected of the under-cured tread did not materialize.

Sixteen laboratories submitted tests on the compounds sent out, or if their machine required a special shaped test piece they made the test piece themselves according to the chosen formulas and tested them. The results showed that there was a large number of machines that proved quite successful. In addition there are machines that give good results on most stocks but which fall down in a few cases. The general situation is so favorable that laboratories generally are placing more and more reliance on abrasion tests.

The committee expects to have additional service tests made and to study the data in detail, drawing more definite conclusions as to the correlation between machine tests and service tests.

Absorption of Vibration:

A Sub-Committee on Rubber Products that Absorb Vibration has also been organized. The S.A.E. and A.S.T.M. are cooperating in this work and the membership of the sub-committee is representative of the rubber and automotive interests.

The committee will confine itself to the study, development and standardization of methods of test which are particularly suitable in the evaluation of rubber stocks for shackles, motor supports, bumpers and shock insulators. Whenever possible the committee intends to cooperate with the instrument makers in the development of whatever testing apparatus may be necessary.

Hardness and compression will receive attention first of all. Active work on hardness testing was started at the first meeting. In order to have a well balanced committee several more consumer members willing to take an active part in this important work are desirable.

The chairman, Mr. L. C. Conradi, Spicer Manufacturing Co., South Plainfield, N. J., will be glad to hear from any men connected with automobile plants who may be interested in the work of the committee.

Committee E-5 to Discuss Committee Procedure

At its meeting to be held in Washington on March 21, Committee E-5 will consider a number of matters affecting committee procedure, of which some have been carried over from its annual report last year as unfinished business and some recently referred to the committee by the Society's Executive Committee. Among the more important of these are:

1. Desirability of reporting letter ballot votes of committees so as to classify affirmative and negative votes of producers, consumers and general interests.
2. Procedure in sub-committees charged with development of complete standards.
3. Status of action respecting standards taken by standing committees at meetings held during the Society's annual meeting, which perforce has not been confirmed by required letter ballot vote.
4. Procedure to be followed in election of committee members, with particular reference to statement of qualifications.
5. Suggested automatic termination of committee membership on change of employment of member.
6. A suggestion that committees arrange to conduct their activities in such a way that their meetings held during the Society's annual meeting will be devoted primarily to the development of plans for the next year's work rather than merely to a review of the work of the past year.

It is expected that consideration of these matters will lead to certain revisions of the Regulations Governing Standing Committees, which, however, to become effective must receive the approval of the Executive Committee.

Methods of Sampling Water Studied

Standard methods of sampling water from lakes and streams are being studied by the Joint Research Committee on Boiler Feed Water Studies, the result of a suggestion made to the Society last year by Mr. Norman F. Prince, Laboratory Director of the Rochester Gas and Electric Corporation. It was felt that this problem could best be studied by the Committee on Boiler Feed Water Studies, upon which the Society is officially represented, and which is closely cooperating with such bodies as the American Public Health Association and the American Water Works Association, interested in the domestic use of water, and such groups as the National Electric Light Association, interested primarily in industrial uses of water. Mr. Prince has been appointed a member of the particular sub-committee studying this problem and has submitted a proposed method and apparatus for sampling that is now under discussion. The problem is being studied in conjunction with methods of analyses of water, to which it is closely related.

The Society representatives on the Joint Committee are Messrs. Max Hecht and F. N. Speller, who are officially following the progress of this study.

Committee C-8 Holds Interesting Meeting

Committee C-8 on Refractories held a very interesting meeting at Atlantic City on February 6. In addition to giving consideration to a number of recommendations dealing with standards, the committee received reports on various investigations under way in sub-committees, such as the research to determine the effect of the method of preparing samples for pyrometric cone equivalent determinations on refractory cements containing sodium silicate and on abrasion testing of refractories at various temperatures. The committee is extending its work on industrial survey to a study of refractory cements. A list of terms relating to refractory cements has been prepared.

Glossary of Terms

Committee E-8 on Nomenclature and Definitions has had under consideration the preparation of a glossary of all of the definitions of terms approved by the Society. Its preparation was not undertaken earlier since the general field of definitions covered by the Society's committees had not been sufficiently well reviewed. The need for a general glossary, however, is apparent when it is considered that many of the definitions, especially those prepared in recent years through the cooperation of Committee E-8, are of a very general nature. One of the functions of the committee is to correlate definitions and, where a standing committee submits a definition that would appear to be of interest to other committees, an effort is made to make such definitions sufficiently general to suit the purposes of all the committees involved. After the definitions have been reworded to make them generally applicable, however, they should be published in such a way that their general applicability will be recognized. The publishing of a glossary will accomplish this purpose and in addition will make all of the definitions more readily available. Work on the glossary is now under way and will be definitely reported upon at the next annual meeting of the Society.

Annealing of Chain

A definite start has been made by the Committee, of the National Safety Council, on Investigation of Effect of Annealing of Chains, on which the Society is represented by Mr. F. M. Waring. A plan of procedure as announced in a recent report of the committee calls for the testing of $\frac{1}{2}$ -in. chain in accordance with the following outline: (1) Analysis of chain stock as received; (2) Tension proof load test and tension test to destruction of chain as received; (3) Impact test of chain stock as received; (4) Chain as received to be subjected to a repeated stress test; (5) Tension proof load test and tension test to destruction of chain after being subjected to a repeated stress; (6) Impact test of chain stock after being subjected to a repeated stress test; (7) Anneal chain at various temperatures; (8) Cooling chain in air and in furnace after being heated for annealing; (9) Tension proof load test and tension test to destruction of chain after each annealing and cooling operation has been completed; (10) Impact test of chain stock after each annealing and cooling operation has been completed; (11) Study of the effect of low temperature heating, following the same procedure as given above; (12) Metallographic studies of chain under the various conditions outlined above.

This plan of procedure was submitted to the members of the committee for consideration and may be modified somewhat in the light of comments received. The tests will be carried out at the Carnegie Institute of Technology.

Mineral Industries Conference

In the January issue of the BULLETIN announcement was made of a three-day conference on slate, cement and steel to be held in the Lehigh district of Pennsylvania, the arrangements for this conference being made through the efforts of Committee D-16 on Slate. The dates for this conference have now been fixed for April 25, 26 and 27. A number of engineering associations, and industrial and civic organizations are cooperating in this conference. Architects, engineers, builders and others interested in construction, have been invited to participate. Opportunity will be offered to visit slate quarries and mills, and cement and steel plants in the Lehigh district. Several technical sessions have been arranged.

New Members to March 1, 1928

The following 60 members were elected from January 10 to March 1, 1928, making the total membership 4215:

Corporation Members (15)

- American Gypsum Co., The., D. W. Griswold.
- Continental Can Co., Inc., W. H. Harrison.
- Detroit Seamless Steel Tubes Co., S. H. Worrell.
- Empire Oil & Refining Co., Clay Briggs.
- Gager Lime Mfg. Co., J. M. Gager.
- Hoover Co., The, W. F. Hudson.
- International Cement Corp., H. A. Sawyer.
- Lawrence Portland Cement Co., C. A. Porter.
- Marathon Paper Mills Co., Allen Abrams.
- Regan Forge & Engineering Co., B. S. Minor.
- Splidorf Electrical Co., I. H. Crowne.
- Stockham Pipe & Fittings Co., L. N. Shannon.
- Western Electric Co., Inc., Hawthorne Mfg. Development, G. S. Rutherford.
- Western Electric Co., Inc., Hawthorne Mfg. Insp., H. R. Peery.
- Western Electric Co., Inc., Kearny Mfg. Insp., F. W. Decker.

Individual and Other Members (41)

- Abbott, A. L. (Diebold Safe & Lock Co.).
- Allen, H. S. (Lock Joint Pipe Co.).
- Australian Commonwealth Engineering Standards Assn., E. S. Maclean.
- Belling, Ejnar (Cia Argentina de Cemento Portland).
- Bulman, J. T. (Louisiana Portland Cement Co.).
- Detroit, City of, Dept. of Water Supply, G. H. Fenkel. (In Perpetuity.)
- Dix, G. E. (Steel Union Co., Inc.).
- Fairchild, J. A. (Kansas Portland Cement Co.).
- Farmer, Harold (The Philadelphia Electric Co.).
- Foster, A. L. (U. S. Bureau of Mines).
- Gerline, Otto (Gerline Brass Foundry Co.).
- Gingerich, Paul (Hamilton Coke & Iron Co.).
- Graham, A. K. (Hanson Van Winkle Munning Co.).
- Green, Henry (Tubize Artificial Silk Co. of America).
- Hailey, O. L. (Texas Portland Cement Co.).
- Hertz, A. (Public Service Co. of Northern Illinois).
- Hitch, A. R. (Gillican-Chipley Co., Inc.).
- Hightower, J. T. (Thomaston Cotton Mills).
- Jacobi, E. N. (Briggs & Stratton Corp.).
- Kellermann, W. F. (U. S. Dept. of Agriculture, Bureau of Public Roads).
- Klein, Harry (Improved Office Partition Co.).
- Krog-Jensen, J. (Cuban Portland Cement Co.).
- Lafayette College, Civil Engineering Dept., F. O. Dufour.
- Mann, H. C. (Union Pacific System).
- McKay, C. R. (Peirce Petroleum Corp.).
- McVetty, P. G. (Westinghouse Electric & Mfg. Co.).
- Miller, J. D. (Cresson-Morris Co.).
- Moore, C. J. (Indiana Portland Cement Co.).
- Newton, R. M. (Newton Naval Stores Co.).
- Pacini, A. J. (Pacini Laboratories).
- Passano, R. F. (The American Rolling Mill Co.).
- Rover, R. H. (Foster Wheeler Corp.).
- Schorndorfer, S. C. (Ferbert-Schorndorfer Co.).
- Sheppard, J. R. (The Eagle-Picher Lead Co.).
- Sorensen, Louis (Cia Uruguaya de Cemento Portland).
- Sporn, Philip (American Gas & Electric Co.).
- Tilley, W. H. (Texas Portland Cement Co.).
- Tung, Teng-Shan (Government Arsenal, Taiyuenfu, Shansi, China).
- Webster, J. A. (Aberfoyle Mfg. Co.).
- Wilkinson, W. H. (E. & A. Smith & Co., Ltd.).
- Zimmermann, H. M. (Alabama Portland Cement Co.).

Junior Members (4)

- Golightly, W. B. (A. O. Smith Corp.).
- Horiguchi, Tada (Dept. of Commerce & Industry of Japan).
- Shoemaker, Lewis F., Jr. (Shoemaker Bridge Co.).
- Smith, P. J. (American Society for Testing Materials).

Student Members

The Student Membership on March 1, 1928, was 114, distributed as follows:

Rensselaer Polytechnic Institute.....	65
Cooper Union.....	22
Cornell University.....	10
Harvard University.....	3
University of Illinois.....	3
University of Michigan.....	3
Columbia University.....	3
Massachusetts Institute of Technology.....	2
Franklin Union.....	1
Newark College of Engineering.....	1
Virginia Polytechnic Institute.....	1

List of Publications

Proceedings, Volume 27 (1927).—The Proceedings for 1927 in two parts: Part I, committee reports with discussions and new and revised tentative standards (1142 pp.); Part II, technical papers with discussions (564 pp.). Prices to non-members: paper \$12.00, cloth \$13.00, half-leather \$16.00. To members for extra copies: \$7.00, \$8.00 and \$11.00, respectively.

Book of A.S.T.M. Standards.—Issued triennially. The 1927 edition (1900 pp.) contains the 340 Standards adopted by the Society. Issued in two Parts—Part I, Metals; Part II, Non-Metals. Prices to non-members: either Part, cloth \$7.50; both Parts, \$15.00; half-leather \$9.00 and \$17.00. To members for extra copies: either Part, cloth \$5.00; both Parts \$9.00; half-leather \$6.50 and \$12.00.

Book of A.S.T.M. Tentative Standards.—The 1927 edition (800 pp.) contains 175 tentative standards issued by the Society. Prices to non-members: paper \$7.00, cloth \$8.00. To members: \$4.50 and \$5.50, respectively.

Separate Standards and Tentative Standards.—Separate copies of all standards and tentative standards are available. The price is 25 cents for a single copy and in lots up to 50. Larger quantities are furnished at lower prices.

Complete Sets of Proceedings from 1902 to 1927, inclusive (with the exception of Vols. I and III). Special prices are made to members for extra copies and for complete sets. Binding in paper, cloth or half-leather.

Index to Proceedings, containing both an author and subject index of committee reports and technical papers and discussions. Index to Vols. I-XII, 1898-1912 (158 pp.). Prices to non-members: \$1.50 in cloth, \$2.00 in half-leather; to members: \$1.00 in cloth, \$1.50 in half-leather. Index to Vols. XIII-XX, 1913-1920 (189 pp.). Prices to non-members: \$2.50 in cloth, \$3.50 in half-leather; to members: \$1.75 in cloth, \$2.75 in half-leather. Index to Vols. 21-25, 1921-1925 (224 pp.). Prices to non-members: \$2.50 in cloth, \$3.50 in half-leather; to members: \$1.75 in cloth, \$2.75 in half-leather.

Special Reprints from Proceedings

Symposium on Effect of Temperature upon the Properties of Metals. Four papers summarizing existing knowledge presented at Cleveland meeting of A.S.T.M. and A.S.M.E., May, 1924, complete with discussion and valuable bibliography (184 pp., paper cover). Price, \$1.50.

Symposium on Corrosion-Resistant, Heat-Resistant and Electrical-Resistance Alloys. Thirteen papers on all phases of the subject presented at A.S.T.M. meeting at Atlantic City, June, 1924, containing three large inset tables of data on ninety of these alloys, complete with discussion (265 pp., paper cover). Price, \$2.00.

1924 Report of Joint Committee on Standard Specifications for Concrete and Reinforced Concrete, including complete specifications with 14 A.S.T.M. specifications and methods of test appended (152 pp., paper cover). Price to non-members, \$1.50. To members, \$1.00.

Special Pamphlet on Textile Materials, containing twelve standards and eight tentative standards, as well as data relating thereto and information concerning the work of Committee D-13 on Textile Materials (106 pp.). Price, 75 cents.

1927 Report of Committee D-2 on Petroleum Products and Lubricants, containing twenty-six tentative and fifteen standard methods of test (245 pp.). Price, \$1.00.

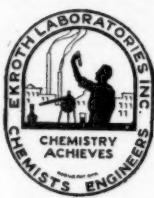
Reports of Committee A-5 on Corrosion of Iron and Steel, for the years 1923, 1924, 1925 and 1926. Separate reprints. Price, 50 cents each. 1927 Report, 75 cents.

A List of Alloys (30 pp.) prepared in 1922 by William Campbell for Committee B-2 on Non-Ferrous Metals and Alloys, giving the compositions of some 1550 alloys, most of which are non-ferrous. Price, \$1.00.

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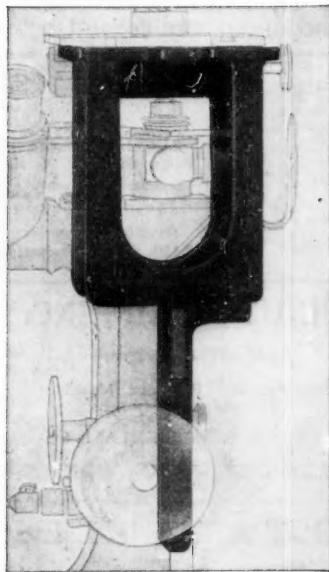
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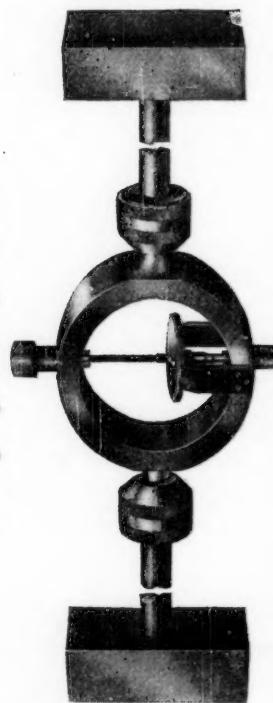
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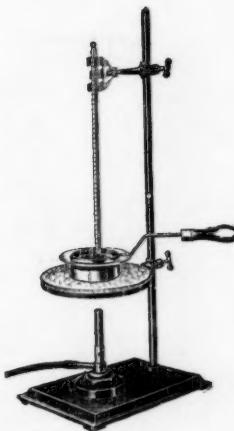
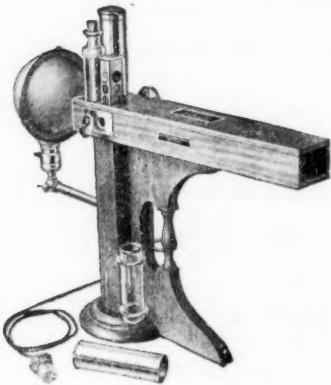


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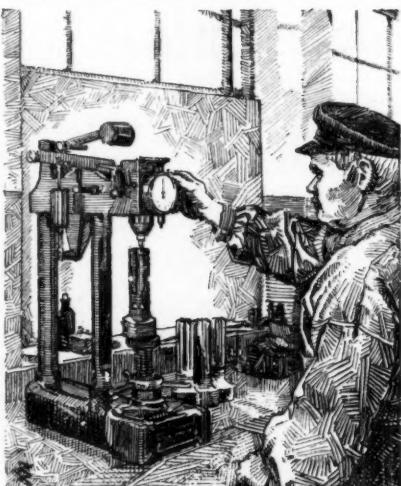


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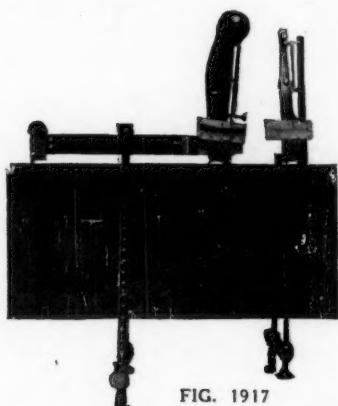


FIG. 1917

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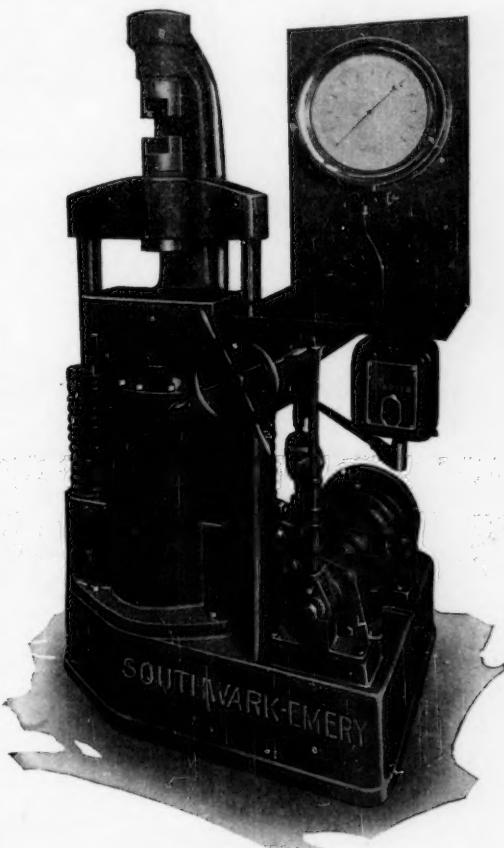
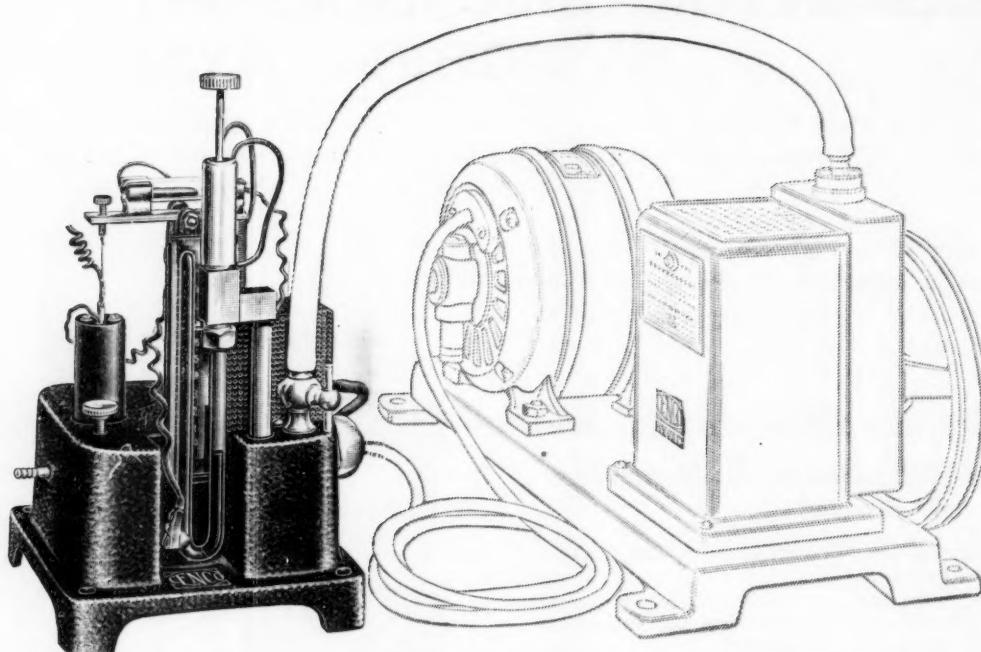


FIG. 1959

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